

LCA, how are you doing today? A snapshot from the 5th German LCA workshop

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1 Introduction

The 5th Life Cycle Assessment (LCA) workshop of the German Network on LCI Data was held from 5th to 7th October 2009 in Freising, Germany, in parallel with the annual conference of the Society for Environmental Toxicology and Chemistry (SETAC) German Language Branch. At this workshop, more than 40 participants from 26 Austrian and German institutions shared insights into their current LCA activities and discussed recent topics. The single contributions are documented in German language by a proceedings publication (Feifel et al. 2009). This article gives a snapshot of central issues of this workshop to sum up the main discussions. Additionally, some perspective LCA activities are pointed out based on a questionnaire.

2 Accuracy vs. applicability and communication of results

LCA practitioners and companies require simplified methods for the environmental assessment of products. They are

challenged by the huge portfolio of products which are potentially subject to assessment. Consumers in turn desire simplified results of environmental assessment methods which are easy to understand.

The Product Carbon Footprint (PCF) is an instrument which claims to raise practicability and to simplify communication of results compared to full LCA (Finkbeiner 2009). Also due to political discussions on the climate change, attention is commonly paid at the method of PCF based on the British PAS 2050 specifications of assessment (BSI 2008). From the LCA point of view, the PCF is a conceptual reduction focussing on climate effects. The reduction may result in ‘burden shifting’ between different impact categories. In contrast, full LCA strives for a comprehensive environmental assessment including different impacts. This criticism is confronted with advantages of PCF such as simplified communication of the results to addressees of environmental assessments (Stichnothe 2009a). The efficacy of the PCF consists in ‘green marketing’ the widespread application and thus improvements along several supply chains (Stichnothe 2009a). Furthermore, disregarding the limited environmental impacts assessed, the PCF has the potential to establish a consistent international eco-labelling system for different products which could support the consumers buying decisions. Currently, the effectiveness of CO_{2eq} product declarations is casted into doubt while for profound knowledge, the experience is largely missing. The common introduction of PCF boosts an increasing demand for specific inventory data, which are currently not available (Stichnothe 2009b; Schmidt 2009b). As a side effect, this pressure may improve the data situation for LCA as well.

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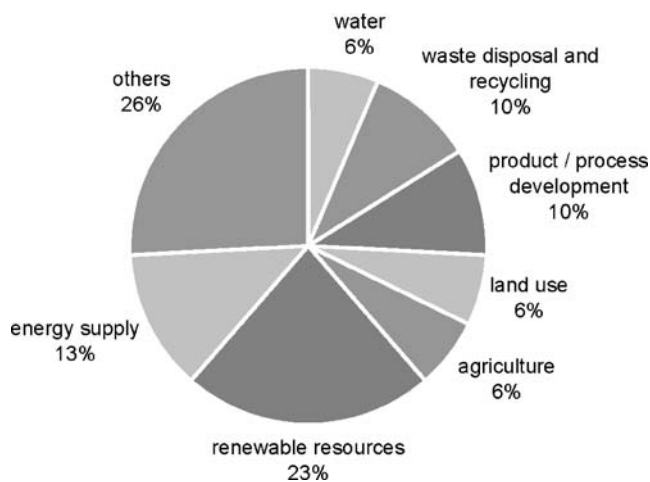


Fig. 1 Shares of application areas of future LCA activities according to questionnaires handed out at the Ökobilanz-Werkstatt 2009

3 Economic allocation revisited

The demand for products is mainly driven by the function these products provide. Thus, the products' functions may be an appropriate causal yardstick when it comes to allocate at multi-product processes. However, how to compare totally different functions of products? Buyers associate values according to the utility they expect from the products' functions. Ideally, market prices mirror these values. This understanding how to deal with co-production was developed by economists starting from eighteenth century Adam Smith over John Stuart Mill until the recent economic practice. If the LCA community adopted this concept of utility as a measure instead of physical properties, this would result in the preference of allocation by prices instead of allocation by physical properties. Indeed, weight is neither a product's property requested

frequently nor generally linked to causality. Thus, the widely applied current practice of allocation by weight appears to be questionable. (Schmidt 2009a).

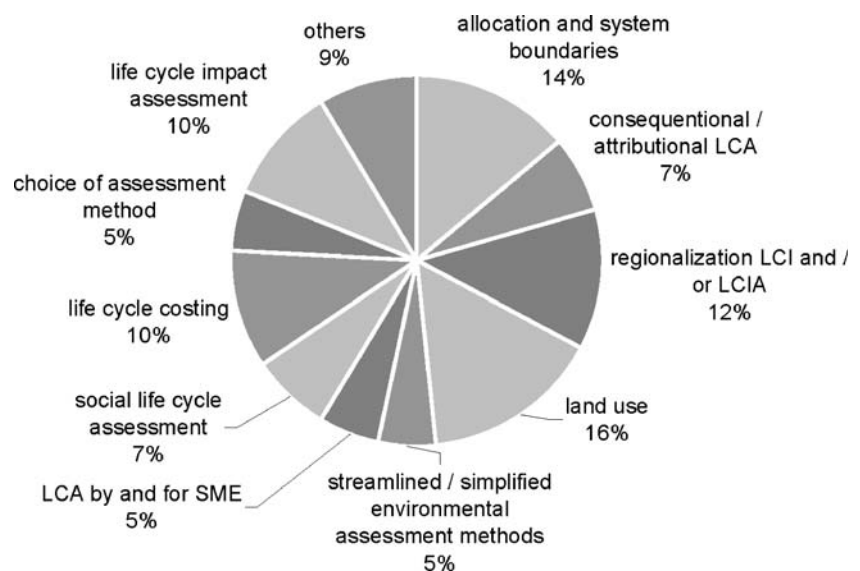
Although Schmidt's arguments are essentially in line with the statements of Guinée et al., the latter authors note that economic allocation relies on perfect markets which may occasionally be a drawback in terms of applicability (Guinée et al. 2002, p 295).

Another issue discussed in context with allocation was the applicability of recycling credits (Walk 2009). A clear guideline is missing, in what cases avoidance of allocation is possible according to the ISO standards (ISO—International Organization for Standardization 2006, ISO 14044:2006, Section 4.3.4.2).

4 Data supply and data exchange

For the preparation of a LCA, each expert depends on the availability of up-to-date and reliable LCI data. In many cases, the most time-consuming task is the ascertainment of appropriate LCI data. The exchange of LCA datasets reduces the efforts of conducting LCA analyses. The first challenge is to identify adequate sources of data, and the upcoming United Nations Environment Program (UNEP)/SETAC database registry will address this demand (Ciroth 2009). There are ongoing developments of the data formats EcoSpold v2 and ILCD which are designed for the data exchange (Ecoinvent 2009; Wolf et al. 2008; Kutsche 2009). Apart from the technical interfaces, there are other aspects relevant for feasibility of exchange. Especially differences in nomenclature imply potential constraints (Jurić 2009). Even if technical solutions are developed, who will tackle the time-consuming mapping of contents?

Fig. 2 Shares of methodological issues in LCA according to questionnaires handed out at the Ökobilanz-Werkstatt 2009



The topic of data and data gaps does not only deal with LCA data but also the utilisation of other data types. The integration of geographical information systems (GIS) appears to be the key for assessing impacts on biodiversity—at least by concept (cf. Section 5). There are also restricted possibilities for complementing LCA data by data from emissions' registers which are interesting as continuous data sources due to regular reporting obligations (Wursthorn 2009).

5 Regionalisation

Regionalisation in LCA is nothing new (Krewitt et al 2001). But nowadays, the discussion about the (energetic) utilisation of biomass and its assessment strengthens the requirement for a regional differentiated LCA. In the centre of debates of regionalisation is competing land use ('food vs. fuel'). Within these debates, politicians ask for decision supporting information about the consequences of biofuel production. Therefore, LCA practitioners either rely on not fully conceived methodology and weak data basis or assess in sophisticated ways, but exceeding actual political time frames.

With reference to appropriateness of data rises the question for geographical detailed descriptions (e.g. geographical entities, resolution) and the applicability in context of data processing. A focus of requirements for regionalisation is the balance of soil organic carbon (SOC) and carbon offset by land use changes. This is not a problem with respect to LCIA, due to established methods for the assessment of many carbon compounds, but it is a question of SOC balances at all and regional specification of SOCs. Especially for energetically used renewable resources, the need to assess carbon offset from soils is documented in literature (Searchinger et al 2008). A combination of LCA with, e.g. a GIS is one opportunity to meet this challenge (Urban 2009).

Additionally, there is a need to assess indirect land use changes including replacement effects. Not mentioned here but also of interest are scarcities of water resources and social aspects, which are discussed in the context of regionalisation as well.

6 Social LCA

The expansion of environmental life cycle assessment to additionally cover the social pillar of sustainability has been considered for a while (Klöppfer 2003, 2008). The recently published UNEP/SETAC Guidelines for Social LCA is certainly a step towards an agreed procedure how to implement social aspects (Benoît and Mazijn 2009). However, the questions of valuing and aggregating social

indicator results remain. Kölsch assessed perceptions on different social aspects by questionnaire. This study may contribute to a weighting of different social impacts categories. The outcomes prove that Europeans set values differently from Brazilian people (Kölsch 2009). Consequently, Social LCA is subject to regionalised impact assessment.

7 Perspectives

The attendees were requested to fill in questionnaires to raise a feedback. Within these questionnaires, it was asked for subject matters of intended activities as well as connected future methodological issues. Figures 1 and 2 show the results of 30 returned forms.

A main application area can clearly be identified: renewable resources. Additionally, energy supply is a major field of LCA activities. Altogether, it can be mentioned that there is a broad variety of subject matters which eludes a distinct classification. These topics vary from assessing chemicals to services within leisure activities. Other fields of interest are waste disposal and recycling as well as LCA in product and process development.

Regarding the methodological issues, there are three main topics which are relevant for the participants: allocation and system boundaries, regionalisation in LCI and/or LCIA as well as land use. Additionally, LCC and LCIA are subjects matter. To sum up, there is a broad variety of methodological issues.

In conclusion and according to the discussions at the Ökobilanz-Werkstatt 2009, there are two principal directions of improvement: on the one hand to go more in detail, e.g. regionalisation and on the other hand increasing simplification and applicability, e.g. PCF. Even if LCA is an established method, the workshop has shown that there are still several methodological issues to discuss and development has not come to an end.

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